Fact Sheets

SRS

SRS "Ship to WIPP" and Transuranic Waste Program

Past and present operations at the Savannah River Site (SRS) produce a variety of types of waste. One of these is called transuranic or "TRU" waste, which means waste that is contaminated above a specific threshold with man-made radioactive elements that have an atomic number greater than that of uranium. At SRS, TRU waste consists of clothing, tools, rags, residues, debris and other items contaminated with small quantities of these elements – primarily trace amounts of plutonium. SRS is committed to managing these waste products in a manner that protects the safety of its workers, the public and the environment.

In 1999, the U.S. Department of Energy (DOE) opened the Waste Isolation Pilot Plant (WIPP), a geologic repository near Carlsbad, New Mexico, specifically constructed for the permanent disposal of TRU waste from DOE sites across the nation. Prior to WIPP's opening, SRS – like the other DOE sites – stored its TRU waste in on-site waste management facilities. Approximately 11,000 cubic meters of waste is stored in drums and large containers primarily on TRU waste storage pads in the Solid Waste Management Facility.

In 2001, following a three-year program to obtain the necessary certification, SRS began shipping its TRU waste to WIPP. Original plans called for shipping all of SRS' TRU waste to WIPP by the year 2034. In 2002, however, the site adopted aggressive new goals that would allow all shipments to be completed by 2014, moving this waste into safe permanent disposal 20 years ahead of schedule, and saving the taxpayer $700 million. By the end of 2002, 50 shipments had been made, compared to the 19 originally scheduled. By the end of 2003, the site will have surpassed the number of shipments originally scheduled through 2014.

Preparing TRU Waste for Shipment

Preparations for beginning shipments to WIPP included the safe retrieval of 8,800 buried TRU drums. These drums were stored in the late 1970s and early 1980s on storage pads and covered with soil for protection from the environment. WSRC began the retrieval project in 1997 and completed it in 1999, two years ahead of schedule.

A crucial step in preparing the waste for shipment is to vent and purge the drums to remove hydrogen and other gases that may have built up in the drums during storage. In the vent-and-purge process, a venting system provides a sparkless puncturing of the drum lid. The machine samples and analyzes the drum's headspace gases. If an explosive concentration is detected, the machine purges the drum with nitrogen to eliminate the hazard. A filter vent is installed in the drum lid to allow for venting to prevent future buildup of gases. The initial project to vent the 11,260 TRU waste storage containers that had been stored on pads (including the retrieved drums) was also completed in 1999, two years ahead of schedule. These containers hold lower-activity

TRU waste. Venting of the higher-activity TRU waste drums, which are stored in concrete culverts, will begin in the summer of 2003.

In order to ship TRU waste to WIPP, SRS must meet the stringent requirements of the WIPP Waste Acceptance Criteria and the Resource Conservation and Recovery Act (RCRA) permit issued by New Mexico Environmental Department (NMED). Extensive characterization of the TRU waste takes place, including:

- All TRU waste drums are assayed to determine the amount of radioactivity in the drum. This examination does not require the drum to be opened.
- All drums are X-rayed to verify that the physical contents meet WIPP waste acceptance criteria.
- All drums undergo headspace gas sampling to detect hydrogen, methane and other volatile organic compounds (described above).
- A sampling of the TRU drums are opened, emptied and visually inspected to verify the accuracy of x-ray results.
- Drums determined to have prohibited items are opened and the waste repackaged, without the prohibited items, prior to shipment. Since the majority of SRS drums were packaged prior to issuance of WIPP acceptance criteria, as many as 30% of SRS drums will require repackaging to remove prohibited items.

In order to meet the ambitious shipping schedule adopted in 2002, SRS teamed with the National TRU Waste Program to host the first deployment of a mobile characterization capability. Three mobile characterization systems were transferred to SRS, making it possible to perform the necessary characterization on the accelerated number of drums.

Packaging TRU Waste for Shipment

Approximately half of the waste is stored in 27,000 55-gallon drums. The remaining waste is stored in non-compliant containers that will require repackaging prior to shipment. Facilities and process for repackaging and characterizing non-drummed wastes are being developed.

After characterization and certification per WIPP and NMED requirements, the drums are placed into Transuranic Package Transporter Model 2 (TRUPACT II) shipping containers. These are a Nuclear Regulatory Commission (NRC) licensed transportation Type-B cask specifically for the transportation of TRU waste.

The TRUPACT II containers have undergone extensive testing in order to demonstrate the ability to provide safe shipment of TRU waste. Tests included:

- Drop Test: a 30-foot drop onto a flat, unyielding surface so that the package's weakest point is struck;
- Spike Drop: a 3-foot drop onto a 6-inch diameter steel rod at least 8 inches long, striking the package at its most vulnerable spot;
- Burn Test: exposure of the entire package to 1,475 degrees (F) for 30 minutes; and
- Submersion: immersion of the package under 50 feet of water.

Ensuring Safe Shipments

A specially designed transport truck carries three TRUPACT II containers along approved transportation routes to WIPP. The routes are designated by the U.S. Department of Transportation (DOT) and the states along each route, and are in compliance with DOT and Nuclear Regulatory Commission (NRC) requirements.

Drivers must pass strict traffic safety and emergency exams, maintain good driving records, and renew their certifications every year.

As part of the preparation for these shipments, the WIPP States and Tribal Education Program, or STEP, initiated training for more than 17,000 emergency response professionals in 18 states along the approved transportation routes. Along the approved transportation route in South Carolina and Georgia, 101 and 2,532 emergency response personnel, respectively, have undergone the STEP training in preparation for SRS shipments. This DOE training, begun in 1988, focuses on response to potential incidents involving WIPP waste shipments. Classes address caring for incident victims, guarding the public welfare, protecting the environment, and ensuring the safety of responders.

A shipment schedule is provided to affected states each year, with a mid-year update. In addition, Georgia and South Carolina state transportation agents perform an extensive vehicle and container inspection before each shipment leaves SRS to confirm the vehicle's safety. Other states along the transportation route perform similar inspections at their respective state borders.

The Transportation Tracking and Communications System uses communications and satellite equipment to track each truck along its route. State emergency response and law enforcement officials can use the system to track shipments through their jurisdictions. The system also makes the appropriate notifications prior to a shipment crossing a state's border.

Shipment Route

The TRU waste shipments leave SRS and travel along SC 125 to Highway 28 into Georgia. The trucks take Interstate 520 to Interstate 20 and continue traveling west on Interstate 20 to WIPP, taking the Interstate 285 By-pass around Atlanta.

Mound Waste

An agreement with the Mound Site (a DOE site near Miamisburg, Ohio, that is undergoing cleanup and closure) makes use of SRS' TRU waste handling capabilities to expedite Mound's closure. Before Mound can be closed, it must remove its inventory of approximately 300 cubic meters of TRU waste. Preparing this waste for WIPP, however, requires waste handling facilities and time. Rather than duplicate the capabilities already in place at SRS, and delay the closure, the Mound Site is sending its waste to SRS for interim storage and preparation for shipment to WIPP. SRS expects to receive the final shipment in September 2003.

For more information on WIPP:
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